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HIGHER EDUCATION AND THE FUTURE OF AFRICA IN THE 21ST CENTURY

(THE ROLE OF THE INSTITUTIONS OF HIGHER LEARNING IN RESPONDING TO AFRICA'S DEVELOPMENT NEEDS AND PRIORITIES)

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I. INTRODUCTION

1. As of now the African economies with few, if any, exceptions have not changed much since the late 1950s. They are still tied to the markets of the developed domestic market economy countries and tied through exports of a few dominant primary commodities. They still depend on the same sources for the bulk of their imports of capital and consumer goods and services. The terms of trade are still determined by declining prices for export products and increasing prices for imports and their balance of payments are still markedly intensified by extreme negative balances in the services account. When there has been a change in the dominant export commodity this has been due, in most cases, to initiatives taken by foreign firms. Food imports continue to grow. Enclaves, semi-enclaves and dysfunctional relations spread instead of disappearing.

2. Identification of savings, capital and investment with money instead of the factor inputs (entrepreneurship; management; manpower; raw and intermediate materials; equipment, parts, implements and tools; technology; physical infrastructure; institutional infrastructure) that savings as money can buy, account in large part for failures of national development plans and for the debt and rehabilitation problems of today.

3. The global imbalances between the demand (by 120 developing countries, China, the CMEA States, etc.) for factor inputs and the supply (by mainly five to ten major exporters of capital goods and services) persist although

some Newly Industrializing Countries are rapidly building up their own supplies of factor inputs including capital goods and services. There also persists unreasonable expectations of, for example, global commodity management for solving the problems of massive imbalances in demand and supply of primary commodities and of factor inputs in return.

4. The limits to foreign exchange earnings by African countries in the future is set by the prospects of exports of (a) primary commodities or (b) manufactures to traditional markets in the developed industrial countries. The prospects with over 100 developing countries attempting to do the same are dim. Imports of capital goods and services from these countries are not only limited by export possibilities but by the massive external debt burden which swallows up substantial shares of foreign exchange earnings. But there is more.

5. The balance of payments and debt crises brought African governments to their knees and obliged them to accept a set of policies and strategies which did not in any way seek to deal with the root causes of debt accumulation (they are almost certainly intensifying that burden) but are the causes of unexpected and adverse consequences, in some cases threatening to damage seriously the foundation of future self-reliant and self-sustaining development and economic growth.

6. These policy measures include the withdrawal of government from active participation in economic production; the liberalization of import trade and of

the inflow and outflow of funds; the sale of public enterprises to the private sector; improvements in the management of public enterprise and the subjection of public enterprise operations to commercial tests of performance; massive devaluations. These do not contribute in any way to the development of factor inputs (entrepreneurship; management; professional and skilled manpower; raw and intermediate materials; equipment, parts, implements and tools; technology; physical infrastructure; institutional infrastructure and services) of domestic origin which in large part account for the need for their imports and for debt, nor do they remove the large and growing number of enclaves, semi-enclaves and dysfunctional relations, nor do they modify the dependence of African economies on one or two dominant primary export commodities, nor do they reduce the high cost of imported capital or of international loans, or of imported goods and services however these may be financed.

7. The only answer therefore is to move Africa to a new trajectory of development which will not only ensure that she avoids recycling balance of payments crises, debt crises, rehabilitation crises, shortage of factor input crises and the like. Such a trajectory would, instead make it possible to build up on national and multi-national bases, rapidly increasing capabilities for a widening range of production and rapidly increasing capacities to absorb and make optimum use of imported factor inputs (i.e. capital).

II. MOVING TOWARDS A NEW DEVELOPMENT TRAJECTORY

8. There is a particular reason why this change of trajectories is particularly important, in addition to the sheer weight of frustration and poverty the new prescriptions have unleashed in Africa.

9. The first reason is that foreign direct investment which would be necessary for participation in the design, setting up and operation of core and strategic industries and sectors has developed a preference for moving from rich countries to rich countries (Japan to the USA and Western Europe; Western Europe to the USA and Japan; USA to Western Europe and Japan). It also moves into areas where there are large growing markets and ample supplies of factor inputs (i.e. savings). It also now eschews owning a large part of the equity, and participation now takes a widening variety of forms such as management, turnkey projects, subcontracted production, etc. so as to limit the risks of participation. Moreover, foreign participation has begun to depend heavily on re-investment of profits. High rates of return are required to attract it.

10. There are, unfortunately, other factors that will make the going harder for those countries in Africa which believe in unmitigated dependence on foreign investment. The first is the prospect of greatly intensified international competition for flows of foreign capital (as investment or loan) as China comes to an understanding with foreign enterprises, as the USSR opens its doors even a little, as Latin America mitigates the debt and

so on, so that the already high rates of return already in vogue are likely to rise higher.

11. Behind this there is at least one other major consideration; the impact on industrial production in developed countries of changes in the age structure of the population in favour of the over-65's; more consumption, less production. This is partly reflected in the overwhelming interest in research and application in robotization and machine intellegence in those countries. It can therefore be said with confidence that policy-makers, planners, entrepreneurs and other leaders (including those in the field of higher education) have no alternative to designing and setting up of this new trajectory.

12. The components of this trajectory have been spelled out not only in the Lagos Plan of Action, the Final Act of Lagos, but also in the objectives, principles and priorities of the Industrial Development Decade for Africa.

13. The trajectory consists mainly in the establishment of internal engines of growth to replace the rapidly weakening North/South engine and consists primarily of the following:

(i) the widening of domestic markets and the linkages of several markets through economic co-operation arrangements;

(ii) the setting up of industries in core areas (the metallurgical, engineering and chemical

industries) to feed into strategic sectors (agriculture; transport and communications; building and construction; mining, fuel and energy; industry itself);

(iii) the planning and production of steadily expanding quantity and improving quality of factor inputs (substitutable for imported factor inputs) so that linkages are deliberately forged between factor inputs, core industries and strategic sectors.

14. An internalized engine of growth can be considered from an angle slightly different from the first i.e. as the effectiveness of the ways in which the principal actors (entrepreneurs and managers - public and private; policy-makers and planners; universities and polytechnics; workers; R&D institutions; consumers; mass media) all organize themselves to pursue, together, the objectives of increasingly self-reliant and self-sustaining development and economic growth in Africa, making use of physical and other resources they have themselves created or have obtained from elsewhere. Of all the resources they create for themselves the most important will include the ability to anticipate, to invent and to innovate and these have to be built upwards from primary school levels. This way of looking at internal engines of growth is presented here in order to point first to illustrations of absurd arguments African policy-makers and planners may unconsciously accept from representatives of some developed economies.

15. One piece of absurdity has been noted elsewhere; the notion that the bulk of entrepreneurial responsibility for development and economic growth in Africa will be on the shoulders of foreign private entrepreneurs rather than on those of national entrepreneurs (private and public) and that, therefore, only the former need special climates of investment particularly in regard to large industries whose outputs are essential for national socio-economic transformation.

16. A second piece of absurdity is the argument that African policy-makers, planners and entrepreneurs ought to devote more time to production for export than to production to meet internal demands for both consumer and capital goods and services. Whilst the importance of exports to finance imports of mainly capital goods and services is beyond question, some reductions in exported quantities of primary commodities would contribute towards a mitigation of the over-supply and price situation which commodity management schemes have not succeeded in substantially and permanently changing.

17. Yet another piece of absurdity is the belief that one of the principal functions of management is to engage in fights with workers and vice versa. Another piece of absurdity is the contra-position of public and private enterprise whose operations, we are told insistently, must be seen as exclusively competitive instead of being mainly co-operative in the circumstances of the Africa Region today. Those two particular pieces of nonsense stand for a large class of either/or propositions of

policy and action; agriculture or industry; heavy or light industry; labour intensity or capital intensity; up-down or down-up; the haves or the have-nots; advanced technology or appropriate technology; planning and control or market forces; foreign or domestic goods and services or factor input supplies; capitalism or marxism/leninism; and so on, all of which are examples of one-dimensional comprehensions of reality which tend to deteriorate into cliches. It would be tragic if, at the start of the efforts of African economic actors to raise their peoples from agonizing levels of poverty, they should become trapped in thickets of cliches of this kind.

18. A fourth piece of absurdity is the conviction apparently held by policy-makers and publicists in those countries, that what may be good for post-industrial societies in the West today are necessarily good and right for pre-industrial societies in Africa today. If those countries are entering a ying (or a yang) period of their own dialectic, then Africans are bound to accompany them; if, in the future, they (almost inevitably) shift towards a yang (or ying) period of their own then again Africa must, willingly or not, accompany them. In the 1970s there was great commotion over the idea of technological delinking of developing from developed economies. Clearly it is intellectual delinking that seems to be most necessary. Universities have a special responsibility for work in this area.

19. Secondly, this presentation brings out, hopefully, the need for determined modification of the powerful divisive factors that are characteristic of African

economies and societies today. It is possible that increasing familiarity with the threat of becoming late-late-late non-starters contrasted with the possibilities of becoming successful late-late-late starters, and benefitting from the accumulated experiences of industrialization in the past hundred and fifty years and the very ample opportunities the latter offer to everyone with initiative, talent and energy may considerably help to moderate these divisive forces. Courage may be taken from recollection of how the prospects of long term irreversible decline overcame the divisive forces that characterized Western Europe from historical times to the eve of the establishment of the European Economic Community.

20. It may seem that our reference to the university as a lookout institution is restricted to the changing national, multi-national and inter-regional realities of the present. This would be a misunderstanding since we have in mind some attempt at considering changes as far ahead as the first 25 years of the 21st century. There are three major aspects of probable change during this period to which we wish to draw attention. The first is the ongoing process of restructuring of the world economy encapsulated in concepts such as: the rise of the Pacific Basin; Fortress Europe centred on the EEC; Fortress North America centred primarily on economic relations between the USA and Canada. This restructuring is only part of the probable massive changes in international relations which are likely to be characterized by population growth and movement; by

increased mobility and communications; by the limits of substitution of synthetic for natural raw materials; by geographical shifts in the pattern of world trade and intensifying changes in its commodity composition; by the associated wrenching around of existing patterns of world transportation and communications; by shifts in world power balance; and by other material considerations.

21. But this is unlikely to be all. It is possible to envisage also the wider spread acceptance of holistic approaches to philosophy and science; marked trends in the mutual interpenetration of cultural values; the more obvious recognition of variations in international languages as they become subject to regional needs and adaptations; possible problems of accommodation among world religions; less bashful questions about whose perspectives on world history are acceptable.

22. It is not unlikely that bitter controversies will arise about proprietary claims to industrial and intellectual property as efforts are made in historical sources of supply of industrial and intellectual property to extend the coverage of these rights and as new geographical sources of material and non-material invention and innovation begin to challenge established sources, and so on. In most of Africa, for several decades to come, only universities contain the rudiments of capabilities to undertake look-out functions that will provide the basis of self-preparation of African communities for these changes not merely in terms of research but of communication - through seminars,

workshops, roundtables, pre-recorded group discussions, etc., - with potential political, business and social leaders, women's and youth movements, trade unions, etc. that is with a steadily widening audience. This, we feel, is one way in which universities will re-establish credibility and earn their keep. Too great a delay will provide opportunities for substitute institutions to be conceived and set up for such functions.

III. WHAT HIGHER EDUCATION MUST DO

23. Although we have presented the challenge to higher education in Africa in terms of scenarios of global changes which will confront the Region by the third decade of the 21st century and although we have argued for the sensitization of policy-makers and planners; entrepreneurs; parlimentarians; other political and social leaders, students, and the public in general to these unfolding potential dangers and opportunities our primary interest at this time is the contribution that third level education can make to the permanent establishment of internal engines of growth in Africa in, say, the next decade to decade-and-a-half.

24. For example in spite of its overwhelming importance for national structural change there seems to be no institution of university status devoted to the systematic study of its many dimensions and problems, even though one notes the valiant efforts of individual university teachers.

(a) Higher Education as Catalyst of Industrial Development

25. We now come to issues of higher education with

accelerated industrial development in mind; the adequacy in range of specialisation of what universities and polytechnics in particular offer as basic manpower inputs into the processes of industrial development; general comments on quantitative aspects of these outputs; observations on the contents and on the organization of teaching/learning processes (including lessons to be learnt by university administrations from newly industrializing countries). We begin by pointing out that of the eight factor inputs we have listed; entrepreneurship; management; man- and womanpower (high level professionals, middle level specialists and supervisors; skilled operatives); raw and intermediate materials; equipment, parts, implements and tools; technology; physical infrastructure; institutional infrastructure, the first three involve direct human resources development and the succeeding five depend on this development. We will therefore concentrate on development of the first group of factor inputs and its relevance for the second group.

26. The first question is, therefore, what universities (at least at subregional levels) have considered should be their contributions (through formal courses, research studies, seminars, workshops, and publications) to the development of African entrepreneurship, bearing in mind the large and increasingly complex burdens part of it will have to accept in the near future. What are universities or university-type institutions doing in developed countries and in NICs in this area? What help are universities considering giving to those who sit

on the boards of public enterprises in the light of ongoing analysis of the entrepreneurial problems of these enterprises (which go far beyond "government interference")?

27. No special attention is given here to small-scale industries since these are now prominent in the minds of policy-makers and planners but the prospects in front of large-scale complex enterprises will also affect medium scale enterprises especially in the field of the metallurgical, engineering, chemical and petrochemical industries. We have to bear in mind here the probability of rapid expansion of sub-contracting production in these areas and the demands this will make on entrepreneurs and managers of medium-scale enterprises. If Africans are not getting ready to move into (not simply take over) these areas of production, non-African enterprises will have to be induced to do so at increasing costs in foreign exchange. What kind of investment climate will entrepreneurs need to get in? What support services will management require to function efficiently in these areas in, say, seven years from now? What can we learn from (again) Japan in the mutual management of subcontracted production and relationships? Are universities and institutes of management expanding their perspectives of the future enough to begin to consider initiatives in these matters?

28. As regards management (the art and the means of influencing the behaviour of colleagues and workers) perhaps the main question should be what concept of

management excellence should guide management education, training and development during the next decade. Would it be enough simply to borrow management concepts and styles from developed countries where financial manipulation, creative accounting, mergers and buyouts are the fashion and where managers unblinkingly watch Dow Jones averages and stock market quotations, where the quarterly announcements of profits take precedence over creating the longer term capabilities for socio-economic sruvival?

29. Where would concerns of environmental protection come in? How would such concepts and associated practices as zero-defects, just-in-time and other methods of raising productivity typical of Japan be evaluated and incorporated in management education and development in Africa? Should stress not be laid on the need for installing measures of preventive maintenance, energy conservation, waste recycling and so on? What provision should be made in formal management education and development for handling R&D and innovation? Should large complex enterprises particularly in the metallurgical, engineering and chemical and in other capital goods industries not be managed by graduates in both engineering and management? Should special efforts be made to familiarize management students with the means by which transnational corporations built up their range and quality of competence? Should not marketing managers for large multi-national enterprises be made aware of the communications and other strengths that served the Japanese trading houses? What arrangements should be made for managers to up-date their familiarity with changing patterns of challenges, national, regional

or global? Should opportunities be created for interchange of management staff between public and private corporations? To what extent should consideraions of this kind be taken along with other measures for the reform of public enterprises today? What amount of familiarity should managers be given with aspects of negotiating partnerships or other relations with foreign companies? What should they know beforehand or through ad hoc courses about new forms of direct foreign investment or trends in foreign direct investment flows or about domestic market structures and dynamics? What relations are being fostered between academic departments of management and institutes for post-experience development of management cadres? What programmes are universities running on management concepts and methods for high level and middle level civil servants?

30. We now move to manpower for development of the other five factor inputs viz, raw and intermediate materials; equipment, parts, implements and tools; technology; physical infrastructure; institutional infrastructure and services. It will be recalled that we described these as among those areas with great possibilities of enlarging the debt problem in the future as demands for them and for foreign exchange to import them expand under pressure where there had been no anticipation of these bulges and consequently no developments of factor inputs and other capabilities arranged in time.

(b) Raw and Intermediate Materials

31. As regards raw and intermediate materials we shall confine attention to mineral ores and metals, to oil

and gas. The first point about mineral ores and metals is the great dependence of Africa on foreign private enterprises established to explore, evaluate, extract (sometimes process) for export. Although national user-companies were set up in the 1980s these were more in the shape of holding companies than corporate instruments of ore production for local or intra-African needs. The poor state and prospects of international demand for ores and metals now presents governments with the need to create instruments for production to meet intra-American needs. What therefore seems to be needed is not only the strengthening of national departments dealing with geology and mining, oil, gas and coal but of expanded, improved or new corporate instruments of production and marketing. Note needs to be taken here of the limited output in Africa of graduates at third and second level of education in the earth sciences. It would probably require 10-15 years' output (at present rates) of graduates in the earth sciences in Africa South of the Sahara to match the size of high level professional staff in only one of Brazil's state mining companies. Further action would mean obtaining manpower profiles on the main branches, activities and levels from, say, Brazil and India; evaluation of existing facilities in Africa and long-term programmes for the strengthening of national offices and public and private companies. This could then be taken to subregional levels for co-operative arrangements including networks to be worked out and implemented. The present position can be judged from the fact that the problem of manpower for the mining industry has been noted in each of the three Regional Conferences on the Development and Utilization of Mineral

Resources in Africa organized by the UN Economic Commission for Africa during the past 10 years and it is only in 1988 that a few of the 21 state participants announced national projects for the development of manpower and facilities. It is difficult, welcome as these are, to see the situation as reflecting a massive regional effort to build up capabilities in such a critical area.

32. The same considerations apply to oil, gas and probably to coal. Little attention seems to be really paid by policy-makers and planners in the Region to the extraordinary petroleum and gas resources of the Region and to the need for a long-term preparatory programme for their evaluation and exploitation and to the conditions of intra-African transport and trade. The role of oil and gas in industrial development is too well known to need recapitulation. The lead times involved in detailed exploration and evaluation are also familiar to policy-makers and planners. The impact of low oil and gas prices on the readiness to undertake exploration and evaluation by foreign private companies is also known and the need for initiatives by African governments and communities must be obvious as is the absence of evidence of such initiatives. However, since oil and gas resources tend to occur off-shore in exclusive economic zones, any preparatory exercise should include these as well as hard minerals in that zones. It is not difficult to visualize preparatory work on manpower profiles for main and supporting activities being prepared with help from, among other countries, India, existing facilities evaluated and tentative plans prepared for rapid contingency action within a decade.

33. The next priority is equipment, parts, implements and tools the inadequacies in supply of which constitute the most significant factor in the rehabilitation crises today. It is not clear to what extent policy-makers and planners are in consultation with administrations of institutions of third level education on the nature and scope of the crises and some of its solutions. It is not simply a matter of the failure over many years to build up national and multi-national capabilities to produce equipment, parts, implements and tools. Nor is it simply a matter of assessing current needs and obtaining foreign exchange to pay for new equipment, parts, implements and tools. A programme based on this approach would simply ensure the recurrence, in a decade or two, of another rehabilitation crises. What is even more important is the incorporation in courses on business management, engineering, development planning, and project design and implementation of the study of preventive maintenance systems not simply as abstract concepts but supplemented by study visits to an actual working system with its computers, testing equipment and staff. At least teachers and instructors should be enabled to obtain this experience and (where students are unable for the time being to participate direclty in such experience) to communicate a strong and permanent sense of its importance and operations through video-tape documentaries. Teachers and students of engineering should be able to take part in the preparation of national inventories of metal working establishments and in evaluations of their potential development.

(c) Physical Infrastructures and the Building and Construction Industry

34. In a Region of such vast, relatively open, spaces

the building and construction industries (materials; design; construction from small to large, and simple to complex structures; R&D; consultancy) as well as the transport and telecommunication industries must inevitably occupy a position of very high demand for factor inputs (domestic or foreign). The needs here are, of course, likely to be intensified by rapid population growth and urbanization.

35. The two observations on which comment is made are firstly the vastness of the future of the building and construction industry in Africa and the challenge this presents to factor input production and quality. The second observation is that if industrial development or more concretely manufacturing enterprises and processes are going to figure in the Region's future, than the availability of courses in business organization, business finance, industrial planning; manufacturing systems analysis and design; manufacturing processes; environmental protection (in regard to both mining and industrial waste); materials design (including economics), plant site planning and development and plant construction, will be critical areas of know-what (experience), know-how (mastery of processes and equipment use) and know-why (scientific explanation). How are these going to be provided for informal, undergraduate and post-graduate and post-experience courses designed and sold to policy-makers, entrepreneurs and the general public? All these will directly affect not only industry in general but physical infrastructure and the building and construction industry. To what extent will Africans (as undergraduates during their long vacation or doing national service) take part

in project design, planning, management and implementation from the design and financial estimation stage to the completion of construction? How many students are to be found on the sites of new towns absorbing knowledge and experience so that the inevitable development of other new towns will be at least partly dependent on local expertise?

36. The other observation concerns transport. It is known that the inadequacies of the Regional transport and communications network constitutes a major barrier to intra-African trade and therefore to intra-African development and economic growth and therefore to any meaningful evaluation of self-reliance and self-sustainment. It is also known that transport and communications can be highly capitl intensive. Furthermore, what seems to be needed first is the development of an intermodal system which combines railways, roads and inland waterways. Yet there is known to exist, at least in Africa South of the Sahara, few institutions for education, training and research in transport systems, analysis and design, transport economics, transport technology and the organizational and technical requirements of intermodal operations, leaving in mind the continuing developments of these technologies elsewhere.

37. These cases are illustrations of much wider range of occurrence of what seem to be defects in the system of higher education which call for early and urgent work by the Association of African Universities, with support from the local and international community.

38. Included in the local community is the business sector (both public and private). As is fairly well-known the business sector has an overwhelming interest in all levels of education. In developed countries the business sector's contributions to education include not merely training schools, polytechnics and even university level institutions to serve its own immediate needs, but the following to third level education in general:

(i) in form of material inputs (equipment, spares, materials, printed matter, buildings, etc.);

(ii) in the form of contributions to curricula design or reform;

(iii) in the form of teachers, lecturers, instructors, from the business sector;

(iv) in the form of opportunities for students and instructors to gain practical experience during e.g. long vacations, national services, and sabbaticals;

(v) in the form of R&D work within the business environment (which enriches training/learning processes for students); educational institutions in turn can programme the organization of teaching/learning arrangements in such a way as not only to exploit fully these resources of the business community but to make such exploitation a mandatory part of teaching and learning and performance evaluation for students and teachers.

39. In this way the output of the system meets not only the immediate perceived needs of a company but the requirements of general growth and expansion of the whole economy on which each company ultimately depends.

40. In this connection attention is drawn to the concept of the teaching company modelled on the teaching hospital whose output is as much graduates in the medical and health sciences and technologies as patients in better health.

41. Although attention has in the last few pages been centred on manpower for industrial development any preparation for the 21st century posing a challenge to policy-makers, planners and leaders of institutions of third level education must include consideration of at least new concerns which include; the extremely rapid growth and obsolescence of knowledge; cross-disciplinarity (increasingly essential for a wide range of applications); environmental protection; the possibilities offered by new communications technologies for both formal and informal teaching and learning; new concepts of production management; designing and implementing bridging courses to shift students from one course to another in the light of changing employment prospects; the impact of intra-African and South/South economic relations.

IV. CONCLUSION

42. We have argued in this paper, that production processes as well as production relations in the global economy are undergoing profound mutations. The knowledge

industry is responsible for these changes which in turn have far reaching effects on the industry itself.

43. Africa as a socio-economic and political entity will be left behind by the turn of the century, unless Africa makes conscious efforts to restructure its economy to ensure long-term sustained and sustainable growth and development. The institutions of higher learning can and should evolve within their walls those types of teaching, learning and research programmes that would provide the skills base for internalzing the development process, establishing linkages and complimentarities among the production sectors and serve as most effective domestic catalysts for growth and socio-economic development, following strategies that are most appropriate to the continent's needs and realities.

44. For Africa's institutions of higher learning to be able to fulfil that role, they would have to venture into new, non-traditional fields of learning viz. entrepreneurship development, management for productiion, productivity and change; exploration, evaluation and extraction of mineral resources, the build up of capability to produce equipment, parts, implements and tools as well as a wide range of areas in engineering and technology education which are as yet unexplored in African institutions of higher learning. They would also have to modify their teaching practices so that as many opportunities as possible are provided to students to learn by doing.

45. Africa's position in the twenty-first century will be determined to a great extent on the African university's willingness to change along the lines being proposed in this paper. If these changes do materialize in the next five years, then Africans can entertain hopes of fulfilling their aspirations for a self-reliant and self-sustained socio-economic development.

Subject areas for formal degree, post-graduate, diploma and ad hoc courses

- Natural resources, economics, planning and management;
- Technological economics;
- International business organization and finance (TNCs);
- Technology transfer adaption and development;
- Regional planning;
- Negotiation skills;
- Information systems;
- The international monetary system;
- International fuel markets;
- Corporate finance strategies and planning;
- Cash flow analysis;
- Commodity markets;
  - Economics
  - Technology
  - Offshore mining; minerals, oil and gas;

- Human resource management in business corporations;

- Transport systems, analysis and design
  Intermodal transport systems;
  Production engineering;

- Master of science shipping, trade and finance;

- Air transport economics, finance and management;

- Optics

- Laser technology

- Master of arts in banking and finance

- Managing critical resources;

- Production and operations management;

- Information management;

- Strategic management;

- Primary commodities in world trade, past, present and future;

- Structural adjustment processes and structural transformation in Africa;

- Financial aspects of economic growth and diversification in Africa:

    - the banking and financial services system and its legislative basis;

- monetary policies in developing economies;

- foreign exchange supply and use; foreign exchange auctions;

- the sources and control of inflation;

- management of currencies;

- fiscal policy and practice;

- government financial reporting and early warning systems;

- multi-national financial co-operation;

- regional banks;

- long-term debt management;

- Competitive marketing strategies;

- Corporate financial strategy and management;

- Management development for engineers;

- The services sector and the developing economy;

- Managing innovation
- Risk evaluation and management

- Fuel and energy as planning and management

- Managing critical resource

- Telecommunications, technology, economics, planning and management

- Master of science, management and implementation of developing projects

- Projections, forecasting scenario writing, modelling

- Debt management

Public enterprises:

- redefinition of rates, reclassification, and criteria of performance;

- problems of entrepreneurship and management;

- problems of privatization;

- relations with private enterprises;

Economic Co-operation:

imperatives and obstacles; conceptual, organizational and implementation aspects;

- Development Planning:

- Conceptual problems
- Data and information bases;
- Space and time dimensions

- Real factor input requirements

Exemptive capacity
Feedbacks, early warning systems and trouble-shooting
Monitoring
Lessons from corporate planning
Problems of management of large industrial complexes

- The implications of National treatment for foreign companies;

- Recent developments in industrial and intellectual property and their implications for developing countries in Africa.

- Critical areas for entrepreneurship and management in Africa in the next two decades;

  - Mining: on shore and off shore minerals, petroleum and gas;

  - The metallurgical industries;

  - The engineering industries;

  - The chemical and petro-chemical industries;

  - The building and construction industries;

  - The transport and communications industries;

  - The services sector and economic growth and diversification (banking and financial services; insurance; procurement, marketing and distribution, standardization, metrology, and quality control, technology choice and equipment selection, preventive maintenance, materials conservation, etc.)